

REMARKS / DISCUSSION OF ISSUES

Claims 26, 28-29, 31-49, 56-57, 59, 63, and 67-81 are pending in the application. Claims 27, 30, 50-55, 58, 60-62, and 64-66 are canceled herein, and claims 67-81 are newly added.

The Office action is unclear regarding the status of claims 39-42, 44-45, 47, 49, and 56. Claims 44-45, 47, 49, and 56 are referenced in the discussion of the rejection of claims 26-30, 32, 34-36, and 38-43 under 35 U.S.C. 103(a) over Hirao and Billington, but are not listed in the rejection, and a basis for the rejection of claims 39-42 is not presented in the discussion of this rejection. If all the pending claims are not subsequently determined to be allowable, the applicants respectfully request that the next Office action be a non-final rejection, so that the applicants have a fair opportunity to address the issues presented for these claims and amend the claims, if necessary.

The Office action rejects claims 26, 28-29, 32, 34-36, and 38-43 under 35 U.S.C. 103(a) over Hirao et al. (USP 6,709,111, hereinafter Hirao) and Billington et al. (USP 6,588,907, hereinafter Billington). The applicants respectfully traverse this rejection.

The combination of Hirao and Billington fails to teach or suggest providing control signals to coordinate cooling and power to the lamp, the control signals specifying predefined pluralities of stepwise intermediate values for cooling and for lamp driver power, between full on and full off, as specifically claimed in claim 26, upon which claim 28 depends. Independent claim 29, upon which claims 31-38 and 57 and 59 depend, and independent claim 44, upon which claims 45-48 depend, include similar features.

The Office action asserts that the combination of Hirao and Billington provides a switching schedule comprising predetermined stepwise adjustments to control parameters of both the lamp driver and the cooling device because Hirao teaches a microcontroller 1 and storage device 1a, and Billington teaches coordinating cooling and power to the lamp when the lamp is switched off. The applicants respectfully disagree with this assertion. Neither Hirao nor Billington address stepwise intermediate values for cooling when the lamp is being switched off, and the Office action fails to identify where either of these references provides this teaching.

MPEP 2143 clearly states that to support an obviousness-type rejection based on the combination of prior art elements according to known methods to yield predictable results, the Examiner must first articulate:

"a finding that the prior art included *each element claimed*, although not necessarily in a single prior art reference, with the *only difference* between the claimed invention and the prior art *being the lack of actual combination* of the elements in a single prior art reference"

The applicants respectfully note that it is the duty of the Examiner to specifically identify each and every element and limitation of a claim in the cited reference as per 37 CFR 1.104(c)(2) and MPEP 707, which explicitly state that "the particular part relied on must be designated" and "the pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified."

Hirao teaches controlling a fan when a lamp is initially turned on, to allow the lamp to reach its proper operating temperature quickly. Hirao does not address controlling either the fan or the power to the lamp when the lamp is switched off.

Billington teaches providing a battery within a projector so that the fan can continue to operate to cool the bulb after power is removed from the projector. Billington does not teach controlling the fan, other than in a fully-on and fully-off condition. Billington suggests a gradual dimming of the lamp, when the user switches the projector off, accompanied by a gradual slowing or speeding of the fan based on the temperature of the lamp, so that an optimal time v. temperature function curve can be maintained.

There is no disclosure or suggestion in either Hirao or Billington that a predefined stepwise control of the fan and the lamp should be performed when the lamp is switched off. Absent any indication from the prior art that the cool down process should include a set of predefined cooling and lighting steps, the applicants respectfully maintain that the rejection of claims 26, 28-29, 32, 34-36, and 38-43 under 35 U.S.C. 103(a) over Hirao and Billington is unfounded, and should be withdrawn.

The combination of Hirao and Billington also fails to teach or suggest a first sensor for detecting an output of the cooling device, a second sensor for detecting a lamp temperature, and a control unit that is configured to control the lamp driver and the cooling device responsive to signals of the first sensor and the second sensor, as claimed in claim 39, upon which claims 40-43 depend.

The Office action fails to provide a basis for this rejection with respect to claim 39. Accordingly, absent a prima facie case, the applicants respectfully maintain that the rejection of claims 39-43 under 35 U.S.C. 103(a) over Hirao and Billington is unfounded, and should be withdrawn.

Further, in *KSR Int'l. Co. v. Teleflex, Inc.*, the Supreme Court noted that the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and that it is "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed:

"Often, it will be necessary ... to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an **apparent reason** to combine the known elements **in the fashion claimed** by the patent at issue. To facilitate review, this analysis should be made explicit." KSR, 82 USPQ2d 1385 at 1396 (emphasis added).

As noted above, Hirao addresses the control of a fan when a lamp is turned on, Billington teaches the control of a fan when a lamp is turned off, the combination of these two references does not lead to a control of the lamp *in the fashion claimed* by the applicants. Even given that one of skill in the art may combine Hirao and Billington, there is no apparent reason that one of skill in the art would modify this combination to control the lamp and fan in the fashion claimed by the applicants.

Because there is no apparent reason to combine Hirao and Billington in the fashion claimed by the applicants, the applicants respectfully maintain that the rejection of claims 26, 29, 32, 34-36, and 38-43 under 35 U.S.C. 103(a) over Hirao and Billington is unfounded, and should be withdrawn.

The Office action rejects claims 33, 39-42, and 48 under 35 U.S.C. 103(a) over Hirao, Billington, and Miyamoto et al. (USP 6,443,575, hereinafter Miyamoto). The applicants respectfully traverse this rejection.

Claim 33 is dependent upon claim 29, claim 48 is dependent upon claim 44, and in this rejection, the Office action relies on the combination of Hirao and Billington for teaching the elements of claims 29 and 44. As noted above, the combination of Hirao and Billington fails to teach or suggest the elements of claims 29 or 44, and Miyamoto fails to cure this deficiency. Accordingly, the applicants respectfully maintain that the rejection of claims 33 and 48 under 35 U.S.C. 103(a) that relies on the combination of Hirao and Billington for teaching the elements of claims 29 and 44 is unfounded, and should be withdrawn.

The combination of Hirao and Billington fails to teach or suggest a lighting unit that includes a first sensor for detecting an output of the cooling device, a second sensor for detecting a lamp temperature, and a control unit that is configured to control the lamp driver or the cooling device responsive to signals of the first sensor and the second sensor, as claimed in claim 39, upon which claims 40-43 depend. Claims 33 and 48 also include a sensor that detects a parameter of the cooling device.

The Office action acknowledges that the combination of Hirao and Billington fails to teach detecting a parameter of the cooling device, and relies on Miyamoto for this teaching. The Office action notes that Miyamoto teaches a sensor "for the purpose of controlling the power supplied to the cooling device". Of particular note, however, this statement has no bearing on the applicants' claimed sensor that detects a parameter of the cooling device and a control unit that controls the lamp driver and cooling device based on this parameter.

The Office action references Miyamoto's FIG. 8 and column 4, lines 43-59 for teaching a fan voltage sensor. The applicants note that this cited section of Miyamoto teaches that the lamp temperature is dependent upon the fan driving voltage, and presents a graph that shows the relationship between a measured lamp surface temperature and a measured fan voltage. However, Miyamoto does not teach that the lighting unit includes a sensor of this fan voltage, nor does Miyamoto teach that the control unit of the lighting unit receives a signal from such a sensor to control either the lamp or the fan.

Because the combination of Hirao, Billington, and Miyamoto fails to teach a lighting unit that includes a sensor of a parameter of a cooling device and a control unit that controls the lamp driver or the cooling device based on a signal from the sensor, the applicants respectfully maintain that the rejection of claims 33, 39-42, and 48 under 35 U.S.C. 103(a) over Hirao, Billington, and Miyamoto is unfounded, and should be withdrawn.

The Office action rejects claims 31, 37 and 46 under 35 U.S.C. 103(a) over Hirao, Billington, and Parker (USP 4,283,658). The applicants respectfully traverse this rejection.

Each of these claims is dependent upon claim 29 or 44. In this rejection, the Office action relies on the combination of Hirao and Billington for teaching the elements of claims 29 and 44. As noted above, the combination of Hirao and Billington fails to teach or suggest the elements of claims 29 or 44, and Parker fails to cure this deficiency. Accordingly, the applicants respectfully maintain that the rejection of claims 31, 37 and 46 under 35 U.S.C. 103(a) that relies on the combination of Hirao and Billington for teaching the elements of claims 29 and 44 is unfounded, and should be withdrawn.

The Office action rejects claims 57 and 59 under 35 U.S.C. 103(a) over Hirao, Billington, and Pruett et al. (USP 6,472,828, hereinafter Pruett). The applicants respectfully traverse this rejection.

Each of these claims is dependent upon claim 29. In this rejection, the Office action relies on the combination of Hirao and Billington for teaching the elements of claim 29. As noted above, the combination of Hirao and Billington fails to teach or suggest the elements of claim 29, and Pruett fails to cure this deficiency. Pruett, like Hirao, teaches controlling the power-on sequence of a lamp to bring the lamp to a proper operating temperature quickly, and does not address providing stepwise intermediate values for cooling and lamp driver power when the lamp is switched off, as claimed in claim 29. Accordingly, the applicants respectfully maintain that the rejection of claims 57 and 59 under 35 U.S.C. 103(a) that relies on the combination of Hirao and Billington for teaching the elements of claim 29 is unfounded, and should be withdrawn.

In the interest of advancing prosecution in this case, the following comments are provided with regard to newly added claims 67-76, as well as dependent claims 32 and 47. The prior art stresses the importance of cooling the lamp after it has been switched off. The prior art does not teach reducing the cooling while maintaining the lamp voltage at or above its operating power level. In like manner, the prior art does not teach turning the cooling device off before turning the lamp off.

With regard to claims 80-81, as noted above, the prior art does not disclose adjusting at least one of the lamp power and the cooling power based on a measure of a parameter associated with the cooling device.

In view of the foregoing, the applicants respectfully request that the Examiner withdraw the objection(s) and/or rejection(s) of record, allow all the pending claims, and find the application in condition for allowance. If any points remain in issue that may best be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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